

REMARKS

Claims 18-37 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with both the written description and the enablement requirements. In particular, the Office Action indicates that the geographic information “is limited to controlling operation of at least one vehicle control system”, but does not fully describe what this entails. Applicants respectfully submit, however, that the subject matter defined in the claims of the present application is fully disclosed in a manner which complies with both the enablement requirement and the written description requirement.

In particular, Figure 1 illustrates the information content of a known commercial digital map, of a type which is well known to those skilled in the art. It includes not only data regarding topology, geometry and attributes (such as number of lanes on a road, etc.) with regard to roads included within the map, but also addresses, restrictions (such as turning prohibitions), points of interest, and polygon information (indicating boundaries of woodlands or cities, etc.). While the latter four categories of information are necessary for the operation of vehicle navigation systems, they are not necessary for the operation of vehicle systems, such as automatic headway control, gear change-adapted systems, etc. Accordingly, paragraph [0033] of the specification, indicates that the information such as “addresses” and “polygons” can be eliminated according to the present

invention, thereby achieving a 42% saving in storage space. (See paragraphs [0032] and [0033].)

In addition, Figure 2 illustrates the universe of information contained in a conventional digital map, broken down as between built-up areas and open areas. As noted in paragraph [0034] the present invention achieves a saving of between 67% and 74% in terms of storage space, by omitting information about “built-up areas”. See also paragraph [0007] and paragraph [0021].

The Office Action indicates that the invention is described in the present application by what it is not (a full database) and not by what it is. Applicants respectfully submit, however, that by defining the universe of vehicle navigation information, as illustrated in Figures 1 and 2, which, as noted previously, is well understood by those skilled in the art, and also indicating those portions of this universe which are excluded for the purpose of preparing the geographic vehicle operation information utilized according to the present invention, the disclosure in this application is not only easily understood and replicated by a person skilled in the art, but it also clearly conveys to such a person the proposition that the inventors had full position of the invention at the time when the application was filed. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

Claims 18-25, 31-34 and 37 have been rejected under 35 U.S.C. §103(a) as unpatentable over Machii et al (Published U.S. Patent Application No. 2005/0159887) in view of German patent document DE 37 00 522A1 (hereinafter referred to as "Zechnall"). In addition, Claims 26-29 have been rejected as unpatentable over Machii et al and Zechnall, and further in view of Jenkins et al (Published U.S. Patent Application No. 2001/0018628) and Claims 30, 35 and 36 have been rejected as unpatentable over Machii et al, Zechnall and Jenkins et al, and further in view of Adachi (Published U.S. Patent Application No. 2008/0198043). However, for the reasons set forth hereinafter, Applicants respectfully submit that all claims which remain of record herein, including new Claim 38, distinguish over the cited references, whether considered separately or in combination. (Claims 29 and 34 have been cancelled, and their substance incorporated into Claim 18.)

The present invention is directed to a sensor arrangement device for operating vehicle control systems, such as for example a radar supported automatic headway control system, a gear change adaptation system, an anticipated curve warning system, a system for forward deflection of vehicle headlights depending on road curvature, a system for warning of approaching no-passing zones, and the like. (See, for example, paragraphs [0026] and [0027].) One important feature of such systems is that the amount of geographic information which they require in order to perform their assigned functions is

much less than that of a digital road map for a vehicle navigation system. For instance, as shown in Figure 1 of the present application, the geographic information contained in a vehicle navigation data base typically includes information such as addresses (21% of the total) and polygons related to information which is to be presented visually during navigation (another 21%). In addition, as shown in Figures 2a and 2b, navigation system databases typically include a large portion of data which characterize built-up areas, which include local streets and stop lights. The systems of the type mentioned previously, however, are intended to operate most effectively in open or undeveloped areas, so that the data concerning built-up areas are not necessary.

Accordingly, the use of geographic information stored in a digital road map for a navigation system requires the incorporation of substantial unnecessary hardware and software into the vehicle system, and may even require the provision of a complete navigation system, in order to extract the information necessary for operating vehicle operating systems. Thus, such a system is inefficient and costly.

The present invention, on the other hand, provides a sensor arrangement for a vehicle control system which includes "limited geographic information" (Claim 18) or a buffer for storing "geographic vehicle operation information" (Claim 37), as well as an input interface for selecting a subset of the geographic

vehicle operation information stored in the buffer and an output for outputting a selected subset of geographic vehicle operation information, which is sent for further processing to the vehicle control system. In addition, Claim 18 further recites that the geographic vehicle operation information referred to therein “consists of geographic information that is limited to controlling operation of said at least one vehicle control system as the vehicle traverses at least one possible route”. In addition, Claim 37 has been further amended to specify that the buffer in which the geographic information is stored is “an isolated buffer cache having only said vehicle operation information stored therein” and furthermore that the geographic vehicle operation information “consists of a non-navigable subset of vehicle navigation digital road map information”, and finally that the latter information includes “only information regarding areas that are not built-up, and excludes i) address and polygon data that are needed for vehicle navigation, and ii) information regarding built-up areas. In addition, new Claim 38 recites that the sensor arrangement according to Claim 18 is formed on a memory chip. It is of course apparent that, given the limited capacity of a memory chip, only a diminished data set, such as described previously could be accommodated therein. (See paragraph [0007].)

Thus, as noted in paragraph [0011] of the specification, in the system according to the invention, a complete separation is achieved between geographic information provided for use in vehicle control systems on the one hand, and a

much more voluminous geographic information used for navigation on the other hand. (See also paragraph [0013].) The latter feature of the invention, as defined in the language quoted above, is not taught or suggested in the Machii et al patent.

Machii et al discloses a vehicle navigation system which uses digital map data in order to guide a vehicle in the manner of a conventional navigation system. However, in order to save on local storage space, only a "simple map" is stored on a memory card 201 onboard the vehicle. As discussed in paragraphs [0008] through [0011] and [0047] through [0050], the simple map includes expressways and national roads, and is a rough map at a lower level. In all events, however, it is used to operate a navigation system for the purpose of providing route guidance to a vehicle. As is illustrated in Figures 18 and 19, and as discussed at paragraphs [0074] through [0085], it is thus apparent that while the extent of the data contained in the so-called "simple" map is limited, it must contain sufficient information to function as a digital road map for vehicle guidance purposes. Thus, as noted in paragraph [0081], it would include information regarding destinations, and addresses as well as detailed intersection information, such as shown in Figure 19a. (See paragraphs [0083] and [0084].)

As discussed in paragraph [0005] of the present application, the Zechall reference (DE 37 00 552 A1) discloses a vehicle based navigation system which includes a digital road map and additional vital information that is used upon reaching an assigned geographical position, and/or is used to control systems in the vehicle. As noted in the specification of the present application, however, for this purpose, the Zechall patent utilizes the full digital map data as contained in the vehicle navigation system, for the purpose of controlling the vehicle systems. As noted in paragraph [0007] of the present application, however, the use of such geographic information stored in a digital map as such is wasteful, and requires an excessive amount of storage space on board the vehicle. This consideration is also discussed in paragraph [0006] of the Machii et al patent.

The Office Action at page 5 indicates that it would have been obvious to one of ordinary skill in the art to use the limited information of Machii et al in the admitted prior art system of Zechall. However, Applicants note in this regard that neither Zechall nor Machii et al teaches or suggests the provision of a diminished set of geographic vehicle operation information, such as defined, for example, in Claim 18 and Claim 37 of the present application. In particular, in neither reference is the data set limited, such that a "consists of geographic information that is limited to controlling operation of said at least one vehicle control system as the vehicle traverses at least one possible route". Moreover, neither reference discloses an isolated buffer cache having only geographic

vehicle operation information stored therein, which consists of a “non-navigable subset of vehicle navigation digital road map information” or that the geographic vehicle operation information includes only information regarding areas that are not built-up, and excludes i) addresses and polygon data such as are neither for vehicle navigation and ii) information regarding built-up areas”. (See Claim 38.) Indeed, because the system in Machii et al is a navigation system, it is apparent that the database necessarily includes all information necessary to operate a vehicle navigation system, including address information, which as noted previously, is expressly excluded by the language of Claims 18 and 37, which recite that the vehicle operation information “consists of a non-navigable subset of vehicle navigation digital road map information”, and that it excludes the sort of address and polygon data that are necessary for the operation of a navigation system. (See MPEP §2111.03 – “The transitional [phrase] ‘consisting of’ defines the scope of a claim with respect to what unrecited additional components or steps, if any, are excluded from the scope of the claim.”)

Accordingly, the incorporation of the “simple” map from Machii et al into the Zechnall system would not replicate the present invention, in that, because Machii et al remains a navigation system, it necessarily includes address and polygon information, such as described previously, which are expressly excluded by the language of Claim 18 and 37.

In light of the foregoing remarks, this application should be in consideration for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323, Docket No. 095309.56021US.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'Gary R. Edwards', written over a horizontal line.

Gary R. Edwards
Registration No. 31,824
Stephen W. Palan
Registration No. 43,420

CROWELL & MORING LLP
Intellectual Property Group
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844
GRE:kms
13173953_1